of the object. In the case Dr. Rhein reports the woman did not have astereognosis in the old sense of the term. That is she could recognize the dimensions of an object and still was utterly unable to give the use of that object. That is to say she could distinguish it as a sphere, a cube, etc. There was no disturbance of sense of position, according to Dr. Rhein, which appeared noteworthy to Dr. Spiller.

THE PATHOLOGY OF ACUTE ANTERIOR POLIOMYELITIS

By W. B. Cadwalader, M.D

The cases which the speaker reported are typical examples of acute anterior poliomyelitis, one occurring in a child and two in adults, dying of bulbar involvement on the seventh, fourth and fifth day of the disease respectively.

Intense round cell infiltration was found throughout the gray matter of the anterior horns of the spinal cord. Cellular infiltration of the pia was very marked, but the infiltrating cells were rarely found on the outer surface of this membrane. The ganglion cells were much degenerated and many destroyed. Changes were found in the medulla and pons and in two cases, the cerebral peduncles, basal ganglia and cerebral cortex were also affected. The white columns of the spinal cord were slightly infiltrated with round cells. In one case neuronophagia was only marked in the lumbar enlargment of the cord. The ganglion cells of the posterior spinal ganglia of one case were severely degenerated.

Conclusions.—1. Acute anterior poliomyelitis is essentially an acute poiloencephalomeningomyelitis.

2. The process is the same during infancy and adult life.

3. The process is most marked in the lumbar and cervical enlargements of the cord and frequently may extend upward as far as the cerebral cortex.

4. Interstitial changes predominate and occur together with parenchymatous changes. Parenchymatous changes never occur without interstitial changes.

5. The localization and intensity of cellular infiltrations depend upon the distribution and vascularity of the area affected.

6. Neuronophagia is an important factor in the destruction of ganglion cells.

Dr. McCarthy said he found Dr. Cadwalader's paper very interesting and very instructive from several standpoints. He took exception to one statement made in the preliminary part in regard to the meningeal changes not being altogether pathologically correct. Dr. McCarthy thought the question of the exudate to a certain extent dependent upon the acuteness of the process. In the usual forms of spinal meningitis, the exudate may be mainly internal, in the tuberculous and septic-tuberculous types the exudate is mainly external.

As to the other septic types of meningitis Dr. McCarthy did not remember whether this exudation is internal or external.

In connection with the subject of neuronophagia Dr. McCarthy said he had a certain amount of interesting material. One is a case Dr. Dercum made a study of at the Philadelphia Hospital and later was admitted to the Phipps Institute, exhibiting a condition in which both the lower and upper extremities, the pectoral muscles, were affected by some atrophic process beginning before birth. Dr. McCarthy went to the Philadelphia Hospital to see the mother of the man in the out wards who stated that the condition was congenital. He also found that Dr. Dercum had made the same diagnosis of congenital poliomyelitis. The examination showed a most extensive disappearance of the anterior horn cells throughout the spinal cord from top to bottom. There were a few cells scattered, just enough to keep up function in a way. There was very little evidence of vascular or scar tissue. This might have been expected since the man was 29 or 30 years old and the condition must have existed since childhood. The mother stated the condition was present from birth. The only explanation for the disappearance of these cells is by diffuse poliomyelitis. The meninges of this case did not show any changes.

Dr. McCarthy also alluded to another case of congenital amputation of the arm, which belongs to the same group of cases under consideration. The amputation occurred about the middle of the arm and microscopic examination of the spinal cord, the patient being a man somewhat over 30, showed marked disappearance of the anterior horn cells. Microscopic examination showed cells much like those he had observed in the adrenal gland of a chicken; that is a retrogressive type of degeneration somewhat different from any other type seen. His conclusion in this case was that the cells were partially destroyed at some prenatal period and that a certain amount of restitution of cell life had taken place, but not enough to bring the cells to the function power of ordinary ganglion cells.

Dr. Spiller thought the rapidity with which nerve cells disappear under inflammatory conditions remarkable. He had reported with Dr. Sherman a case of poliomyelitis where the gray matter was involved and the white matter also, but less intensely. The man was able to walk 38 hours before he died. When Dr. Spiller examined the spinal cord it was extremely difficult to find any nerve cells in certain portions.

The view Dr. Cadwalader expressed is the view Dr. Spiller has held for a number of years, viz., that there is not a strict limitation of the process to the gray matter. Dr. Spiller said he had studied a case in which poliomyelitis followed small-pox and the gray matter alone was involved in the lumbar region, but in the thoracic region the white columns did not escape. Another explanation why the lumbar region is so often involved is that it is very vascular.

Strümpell has advanced the view that there is a process similar to poliomyelitis occurring in the brain in polioencephalitis. The existence of this condition has been doubted. Dr. Spiller said he had had the opportunity in the last few years to examine three cases of encephalitis in which the inflammation was almost confined to the gray matter, although there was some slight involvement of the white matter immediately adjacent. He believes a process occurs in the brain which is not diffuse encephalitis, but is really polioencephalitis, the gray matter being far more involved, the adjacent white matter being only slightly affected.

Dr. Cadwalader, in closing, said that when he spoke of a meningitis occurring in poliomyelitis in contrast with a meningitis of other conditions, he did not intend to convey the idea that the infiltrating cells in the septic conditions were necessarily always confined to the outer surface of the pia. In his poliomyelitis cases and he thinks in all the instances he has been able to find in literature inflammatory cells on the outer side were very rarely found. In fact they were so few as to be very questionable. Therefore, it is assumed by many writers that the infection might possibly come from the lymph channels between the cord itself and the pia. But that seems to be very doubtful at the present time, so far as any anatomical explanation is concerned. As to the neuronophagia, he thinks there is a possible explanation for the varieties of the cells found in the infiltration. Numerous writers have claimed to be able to demonstrate inflammatory cells which have burrowed into the substance of a ganglion cell and the ganglion cell itself having gradually disappeared, then the lymphocyte or lymphocyte-like cells increased in their protoplasm at the expense of the ganglion cell and the nuclei stained a deeper blue color with various stains. In other words a deeper staining reaction of the nucleus. Here may be a possible explanation for the many different varieties of cells seen in this form of inflammation which has puzzled everyone so far. No one seems to have arrived at any definite conclusion as to where they come from.

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The President, DR. B. SACHS, in the Chair

A CASE OF REFRIGERATION BELL'S PALSY ACCOMPANIED BY LATERAL OSCILLATION OF THE EYEBALL

By L. Pierce Clark, M.D.

The patient was a boy with complete refrigeration Bell's palsy of the right side of the face of ten months' duration. The case was of special interest because of a peculiar lateral oscillation of the right eyeball during a forceful attempt to close the eyes. This movement of the eyeball appeared to be largely induced by the internal rectus at the beginning of the act in closing the eyes. At the beginning the right eyeball was moved inward and upward, as was usual in these cases. The movement was no sooner begun than the lateral see-saw nystagmoid movement began. The left eye also exhibited the same movement but in a much less degree, and was partly under the control of the will. It might be inhibited at the beginning or end of the attempt on closure, but not while the strongest effort was being put forth. The lateral oscillation occurred only on attempt to close the eyes; no other facial movement brought it out. Schlesinger recently reported a similar phenomenon in a medullary lesion of the seventh and twelfth nuclei, which gradually passed away as the primary lesion improved. Dr. Clark said that so far as he was aware, this was the first report of a case of the occurrence of this form of eye movement in a typical case of Bell's palsy. The explanation of this eye symptom was that a voluntary impulse attempted transmission over the seventh nerve, but being blocked by the palsy lesion, it overflowed by way of the posterior longitudinal bundle into the third nucleus. It was known that the movements of all extrinsic muscles of the eyes were so closely related, that some anatomists claimed a common nuclear origin for all muscles of the eye; that is, that the orbicularis palpebrarum partly originated in the hinder portion of the third nucleus. The internal rectus being the strongest intrinsic eye muscle whose movement was most inti-